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AS

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/040,825	03/18/98	FRYBERG	M ICH275

025230  
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IM62/0803

EXAMINER

YAMNITZKY, M

ART UNIT	PAPER NUMBER
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1774

14

DATE MAILED:

08/03/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

# Office Action Summary

Application No.  
09/040,825

Applicant(s)  
Mario FRYBERG et al.

Examiner  
M. Yamnitzky

Group Art Unit  
1774



☒ Responsive to communication(s) filed on Jul 14, 2000

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three (3) month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 3-12 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 3-12 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☒ Interview Summary, PTO-413 (Paper No. 11)

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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1. The request filed on 07/14/00 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/040,825 is acceptable and a CPA has been established. An action on the CPA follows.

The preliminary amendment filed with the CPA request has been entered. The preliminary amendment amends the specification, cancels claims 1 and 2, amends claims 3-7 and 11, and adds claim 12. The changes made by preliminary amendment are the same as the proposed changes in the unentered amendment after final filed 05/18/00 with the exception that the preliminary amendment does not contain the typographical error that is present in claim 12 in the unentered amendment.

Claims 3-12 are pending.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Most of the issues raised under 35 U.S.C. 112, second paragraph in Paper No. 8 are overcome by applicants' amendment. The remaining issue is set forth in this Office action.

The rejection of claims 1, 4, 8 and 11 under 35 U.S.C. 102(b), as set forth in Paper No. 8, is overcome by applicants' amendment.

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3. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The molecular weight limitation renders claim 5 indefinite because it is not specified how the molecular weight is determined (e.g. is the molecular weight a number average molecular weight or a weight average molecular weight?).

4. The remarks accompanying the preliminary amendment state that the molecular weight is a weight average molecular weight. However, the examiner does not find an original disclosure that the molecular weight is "weight average". If the specification teaches that the molecular weight is a weight average molecular weight, applicants are requested to identify such teachings, by page and line number, and the examiner will withdraw the rejection of claim 5 under 35 U.S.C. 112, second paragraph.

5. Claims 3, 4, 6-8, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smigo et al. (5,281,307).

Smigo et al. disclose a paper coated with a polyvinyl alcohol/vinyl amine copolymer containing between 0.5 and 25 mole% vinylamine units, preferably 2 to 12 mole% vinylamine units. The copolymer may be made by copolymerizing vinyl acetate with N-vinylamides such as N-vinyl formamide or N-vinyl acetamide, following by hydrolysis of the vinyl acetate to vinyl

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alcohol and hydrolysis of the vinyl amide to vinylamine. A crosslinking agent may also be used to crosslink the copolymer. See the whole patent. In particular, see column 1, line 44 to c. 2, l. 22, c. 4, l. 61 to c. 5, l. 25, c. 6, l. 8-20, c. 6, l. 36-60 and Examples 1-5.

- Smigo et al. apply the copolymer in dry end addition to cellulosic based materials. In the background discussion, Smigo et al. teach that various other additives such as starch, carboxy methyl cellulose, polyvinyl alcohol and polyacrylic emulsions are common dry end additives (c. 1, l. 55 to c. 2, l. 10). It would have been an obvious modification to one of ordinary skill in the art at the time of the invention to include one or more of the commonly employed additives disclosed by Smigo et al. in combination with the copolymer. One of ordinary skill in the art would have been motivated to use other commonly employed additives for the properties afforded by those additives.

Although Smigo et al. do not disclose the coated paper as a "recording sheet for ink jet printing" and do not disclose the coating as a layer "receptive for aqueous inks", the present claim terminology of "recording sheet for ink jet printing" and "receptive for aqueous ink" indicates the intended use of the claimed coated support. Absent a showing to the contrary, it is the examiner's position that the prior art coated paper is capable of functioning as a recording sheet for ink jet printing and the prior art's coating comprising crosslinked polyvinyl alcohol/vinyl amine copolymer is receptive for aqueous inks.

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6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smigo et al. (5,281,307) as applied to claims 3, 4, 6-8, 11 and 12 above, and further in view of Oliver et al. (5,270,103).

In the examples of the Smigo patent, a fully hydrolyzed, "medium molecular weight," water soluble copolymer from Air Products and Chemicals is used. Whether a copolymer having a "medium molecular weight" would have a molecular weight within the range of 20,000 to 150,000 as required by present claim 5 is not certain, though the examiner notes that the present specification discloses that usable copolymers are available from Air Products & Chemicals, Inc. (p. 16, lines 13-14).

At column 6, lines 21-36 of the patent to Oliver et al., polyvinyl alcohol polymers available from Air Products are described in terms of number average molecular weight. Polymers having a number average molecular weight of 85,000-146,000 are referred to as polymers with a "medium number average molecular weight" (c. 6, l. 34-35). Although the polyvinyl alcohol polymers of the Oliver patent are not the same as the vinyl alcohol/vinyl amine copolymers of the Smigo patent, it is the examiner's position that it is reasonable to expect that the "medium" molecular weight copolymers from Air Products which are used by Smigo et al. would have a molecular weight similar to the "medium" molecular weight polymers from Air Products which are described by Oliver et al, in which case the copolymers used in the examples of the Smigo patent have a molecular weight within the scope of present claim 5.

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Alternatively, and absent a showing of criticality for the molecular weight of the copolymer, it is the examiner's position that it would have been within the ordinary skill of a worker in the art at the time of the invention to determine usable and optimum molecular weights for the copolymer based on factors affected by molecular weight such as viscosity.

7. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smigo et al. (5,281,307) as applied to claims 3, 4, 6-8, 11 and 12 above, and further in view of Kobayashi et al. (5,910,359).

In column 6 of the Smigo patent, various crosslinking agents such as epoxy resins and aldehydes are disclosed. Smigo et al. do not explicitly disclose the crosslinking agents required by present claims 9 and 10, but Smigo et al. further teach that "other crosslinking agents commonly employed for poly(vinyl alcohol)" may be used to crosslink the vinyl alcohol/vinyl amine copolymers.

Kobayashi et al. disclose various crosslinking agents which may be used for crosslinking water-soluble resins such as polyvinyl alcohol. The crosslinking agents disclosed by Kobayashi et al. include aldehydes, epoxy resins, and triazine derivatives such as 2,4-dichloro-6-dihydroxy-s-triazine (s-triazine is 1,3,5-triazine as required by present claim 10).

Absent a showing of criticality for a particular crosslinking agent, it is the examiner's position that it would have been within the ordinary skill of a worker in the art at the time of the invention to select from crosslinking agents known to be usable for crosslinking polyvinyl alcohol,

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as directed by Smigo et al.; with crosslinking agents within the scope of present claims 9 and 10 being known to be usable for crosslinking polyvinyl alcohol as demonstrated by the patent to Kobayashi et al.

8. Claims 3-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kono et al. (4,801,497) or Kashiwazaki et al. (5,747,146), either of these patents taken in view of Smigo et al. (5,281,307).

Kono et al. and Kashiwazaki et al. disclose recording media for ink jet printing comprising a support and at least one ink-receptive layer. Both of these patents teach the use of cationically modified polyvinyl alcohol in an ink-receptive layer.

Kono et al. disclose the use of cationically modified polyvinyl alcohol wherein the cationic group is present in the polymer in an amount between 0.05 and 20 mole percent. The cationically modified polyvinyl alcohol is used in combination with one or more other polymers. See the whole patent. In particular, see the abstract, column 4, lines 11-18, c. 4, l. 59 to c. 6, l. 16 and c. 7, l. 35-53.

Kashiwazaki et al. disclose the use of cationically modified polyvinyl alcohol as a binder in an ink-receptive layer wherein the cationic group is preferably present in the cationically modified polyvinyl alcohol in an amount between 0.05 and 30 mole percent, more preferably between 0.1 and 10 mole percent. The cationically modified polyvinyl alcohol may be used in combination



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with one or more other water-soluble resins and/or water dispersible resins. See the whole patent.

In particular, see column 5, line 35 to c. 6, l. 29 and c. 7, l. 8-29.

Neither Kono et al. nor Kashiwazaki et al. explicitly disclose a copolymer of the general structure set forth in present claim 12, although such a copolymer is within the scope of each patent's cationically modified polyvinyl alcohol which is a polyvinyl alcohol having a cationic group such as a primary, secondary, or tertiary amino group, or a quaternary ammonium group. The copolymer required by the present claims is a polyvinyl alcohol having a primary or secondary amino group. The mole percent range for the cationic groups as disclosed by Kono et al. (0.05 to 20 mole percent) encompasses the relative amount of vinyl amine units required by the present claims ( $y = 0.05$  to  $0.2$ , which is 5 to 20 mole percent). Kashiwazaki et al. also disclose a mole percent range (0.05 to 30) which encompasses the presently claimed range for  $y$ . Both patents disclose a preferable range (0.1 to 10) which overlaps the presently claimed range for  $y$ .

Smigo et al. disclose a paper coated with a polyvinyl alcohol/vinyl amine copolymer containing between 0.5 and 25 mole% vinylamine units, preferably 2 to 12 mole% vinylamine units. The copolymer may be made by copolymerizing vinyl acetate with N-vinylamides such as N-vinyl formamide or N-vinyl acetamide, following by hydrolysis of the vinyl acetate to vinyl alcohol and hydrolysis of the vinyl amide to vinylamine. A crosslinking agent may also be used to crosslink the copolymer. See the whole patent. In particular, see column 1, line 44 to c. 2, l. 22, c. 4, l. 61 to c. 5, l. 25, c. 6, l. 8-20, c. 6, l. 36-60 and Examples 1-5. The copolymers disclosed by Smigo et al. are polyvinyl alcohols containing amino groups, and are inherently cationic.

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Smigo et al. teach using the copolymers to coat paper and paper-type products in order to provide improvements in properties such as dry strength, wet strength and fold resistance.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the copolymers disclosed by Smigo et al. as the cationically modified polyvinyl alcohol used in the recording medium of Kono et al. or Kashiwazaki et al. One of ordinary skill in the art would have been motivated to do so by the fact that the copolymers taught by Smigo et al. meet Kono's and Kashiwazaki's requirements for the cationically modified polyvinyl alcohol including the mole percent requirements for the cationic group, and by Smigo's teachings regarding the improved properties provided by using the copolymer. One of ordinary skill in the art would recognize that the improved properties taught by Smigo et al. would be beneficial with respect to a recording medium for ink jet printing.

The molecular weight range required by present claim 5 is considered to be *prima facie* obvious in view of the teachings in the Kono patent and the Kashiwazaki patent regarding preferred degrees of polymerization for the cationically modified polyvinyl alcohol.

9. As discussed during the telephonic interview with applicants' representative on 06/20/00, applicants' arguments traversing rejections under 35 U.S.C. 103(a) on the basis that the present invention uses different amounts of copolymer than used in the prior art and/or on the basis that the present invention uses different supports than used in the prior art are not persuasive since the present claims do not limit the support or the amount of copolymer in the ink-receptive layer.

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Also see the examiner's comments on pages 7-10 of Paper No. 8 regarding applicants' arguments traversing rejections under 35 U.S.C. 103(a).

10. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (703) 308-4413. The examiner can generally be reached at this number from 6:45 a.m. to 3:15 p.m. Monday-Friday.

The current fax numbers for Art Unit 1774 are (703) 305-3599 for official after final faxes and (703) 305-5408 for all other official faxes. (Unofficial faxes for Art Unit 1774 can be sent to (703) 305-5436.)

MRY  
08/02/00



MARIE YAMNITZKY  
PRIMARY EXAMINER

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